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ABSTRACT

Designed for the student who has acquired basic computational skills with non-negative rational numbers, this guidebook delineates minimum course content to further develop students' computational skills with whole numbers. Place value and estimation are also covered. General goals, performance objectives, a course outline, suggested teaching strategies, sample test items, and a list of six references are provided. The quin is based on chapters from the text, "Essentials of Mathematics 2", by Sobel, Maletsky and Hill. (DT)

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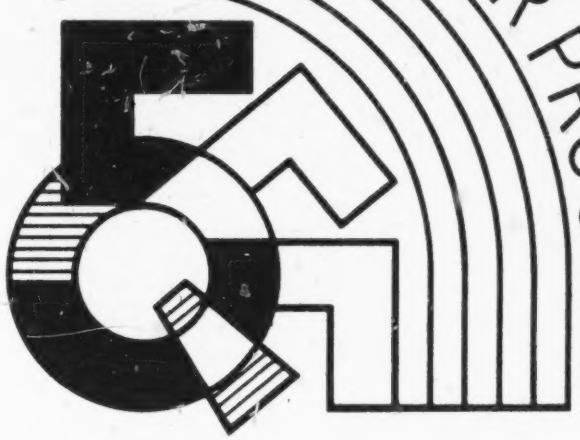

DADE COUNTY PUBLIC SCHOOLS

ACTIVITIES WITH WHOLE NUMBERS

5212.73, 5213.73

MATHEMATICS

SE 016 502

DIVISION OF INSTRUCTION • 1971

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QUINMESTER MATHEMATICS

COURSE OF STUDY

FOR

Activities with Whole Numbers

5212.73
5213.73

(EXPERIMENTAL)

DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida 33132
1971-72

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PREFACE

The following course of study has been designed to set a minimum standard for student performance after exposure to the material described and to specify sources which can be the basis for the planning of daily activities by the teacher. There has been no attempt to prescribe teaching strategies; those strategies listed are merely suggestions which have proved successful at some time for some class.

The course sequence is suggested as a guide; an individual teacher should feel free to rearrange the sequence whenever other alternatives seem more desirable. Since the course content represents a minimum, a teacher should feel free to add to the content specified.

Any comments and/or suggestions which will help to improve the existing curriculum will be appreciated. Please direct your remarks to the Consultant for Mathematics.

All courses of study have been edited by a subcommittee of the Mathematics Advisory Committee.

CATALOGUE DESCRIPTION

A course which will develop computational skills with non-negative rational numbers through activities that promote interest. Emphasis is on whole numbers.

Designed for the student who has acquired basic computational skills with non-negative rational numbers.

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GOALS

1. To further develop computation skills with whole numbers.
2. To maintain computation skills with fractions, decimals, and percents.
3. To develop a positive attitude toward mathematics.
4. To develop problem-solving skills.

OVERALL STRATEGIES

1. This quin is based on the state-adopted text, Essentials of Mathematics, 2 by Sobel, Maletsky and Hill. Chapters 1, 2, and 3 constitute the core of this course.
2. Do not cover more than chapters 1, 2, and 3 of the text as the remaining chapters are covered in other quins.
3. A pre-test should be administered to determine the ability of the students to work with whole numbers. All deficiencies should be noted, and activities should be planned to help each student overcome his particular deficiencies and develop additional skills.
4. Although some of the skills work can be done with the class as a whole, there should be individual prescriptions made for those students who do not master the skills during regular classroom instruction.
5. Performance objectives are listed only for computational skills. The performance in other areas is left to the teacher's discretion, depending on the ability level of the students he is teaching.
6. The skills work will need to be supplemented. This can be done with work from any basic text, by using any of the resources listed at the end of the quin, or by use of ditto material.
7. It is suggested that all of the activities in the text be used to help motivate the students.

PERFORMANCE OBJECTIVES FOR SKILLS

These objectives represent the minimum expectations for student performance at the end of a nine-week period.

The student will:

1. Specify the place value of any digit of a whole number of eight digits or less.

2. Express in exponential notation the place value of any digit of a whole number of eight digits or less.

3. Translate the numerical notation of any whole number of eight digits or less into the equivalent verbal form.

4. Translate a verbal expression of any whole number of eight digits or less into the equivalent numerical notation.

5. Round any whole number of eight digits or less to a specified unit of place value.

6. a. Find the sum of any set of whole numbers in vertical format.
   b. Find the sum of any set of whole numbers in a horizontal format.

7. a. Find the positive difference of any two whole numbers in vertical format.
   b. Find the positive difference of any two whole numbers in horizontal format.

8. Find the product of any two whole numbers.

9. Divide any whole number of four digits or more by any one, two, or three digit whole number.

10. Estimate answers to problems involving operations with whole numbers.

11. Solve selected verbal problems involving operations with whole numbers.

COURSE OUTLINE

I. Skills--Whole Numbers

A. Meaning
   1. Place value
      a. naming
      b. expressing in exponential notation
   2. Numerals to words
   3. Words to numerals
   4. Rounding

B. Computation
   1. Addition
   2. Subtraction
   3. Multiplication
   4. Division--1, 2, or 3 digit division

C. Problem-solving
   1. Estimated solution
   2. Exact solution

II. Other Topics

A. Patterns

B. Flow charts

C. Translating words to symbols

D. Exponents
   1. Meaning
   2. Squares
   3. Square roots

E. Evaluating simple algebraic expressions

F. Integers
   1. Meaning
   2. Addition
   3. Subtraction

STRATEGIES

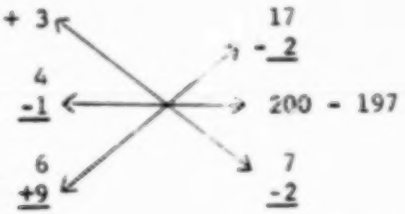
1. Have students make a chart showing a comparison of numbers in regular expanded form and in exponential expanded form.

2. After spelling and place value concepts have been mastered, a cross number puzzle using the word expression of numbers is a good reinforcer for reading and writing whole numbers.

3. Don't pass up the opportunity for the addition drill that students will have if they check their subtraction problems.

4. To practice both addition and subtraction:
Fun Matching (something of this type, only much harder)

Ex. $2 + 3$ $\quad$ $17 - 2$ $\quad$ $200 - 197$ $\quad$ $4 - 1$ $\quad$ $6 + 9$ $\quad$ $7 - 2$



5. If students are having trouble with addition or multiplication because they are not writing down the numbers they carry, showing them a systematic way to write the numbers carried may be beneficial.

6. When teaching division, use divisors with small digits to make the division easier. In this way the student can learn the process without getting too discouraged. He can work with the larger digits once he has mastered the process.

7. When estimating answers, be sure to stress that there is not just one way to estimate. Instruct the students to round to tens, or round to the largest place value of each number when estimating. Have the students estimate in several different ways and then compare their answers.

8. From this stage on, students should be encouraged to estimate the answer to most problems prior to calculation.

9. Estimating distance in feet or inches followed by measuring is a productive activity.

SAMPLE TEST ITEMS FOR SKILLS

(Keyed to the Objectives)

The skills tested represent a minimum for the 9-week course.

1. Give the place value name of the 7 in each number.
   a. 57,053,219
   b. 10,370,442

2. Expand each number using exponential form.
   a. 1,803,725
   b. 35,007,500

3. Write the word name of each number.
   a. 15,607,000
   b. 7,042,340

4. Write a numeral for each number.
   a. Twenty-three million, six hundred thirty-two thousand, nine hundred seventy-five.
   b. Six million, four thousand, seventy-two.

5. a. Round 6,937,586 to thousands.
   b. Round 47,805,000 to millions.

6. Find the sums.

a.	b.	c.
3725 +8416	37 85 96 +41	269 + 35 + 869
		d. 5802 + 39 + 605 + 298

7. Subtract.

a.	b.	c.
2605 -1983	29000 -18407	6293 - 467
		d. 50000 - 12461

8. Multiply.

a.	b.	c.
82 x34	629 x406	57 x 23
		d. 15 x 826

9. Divide.

a.	b.	c.
$6\overline{)5874}$	$23\overline{)851}$	9729 ÷ 47
		d. 2756 ÷ 212

10. Choose the answer that is the best estimate for each problem.
    a. There are 257 washers in a box. If 30 washers are to be packed in a package, how many packages will there be?
       1. 290 2. 750 3. 8 4. 9000

b. A man gave the clerk $50 for a bicycle that cost $37. How much change did he receive?
1. $10 2. $150 3. $90 4. $3

11. Solve each problem.
a. How far can a car go on a tankful of gas if the tank holds 18 gallons and the car averages 17 miles per gallon?
b. John wants to buy a car that costs $1550. He has saved $900 and pays this in cash. If he pays $50 per month, how long will it take John to finish paying for the car?

ANSWER KEY

1. a. millions
   b. ten thousands

2. a. $(1 \times 10^6) + (8 \times 10^5) + (3 \times 10^3) + (7 \times 10^2) + (2 \times 10^1) + (5 \times 10^0)$
   b. $(3 \times 10^7) + (5 \times 10^6) + (7 \times 10^3) + (5 \times 10^2)$

3. a. Fifteen million, six hundred seven thousand
   b. Seven million, forty-two thousand, three hundred forty

4. a. 23,632,975 b. 6,004,072

5. a. 6,938,000 b. 48,000,000

6. a. 12141 b. 259 c. 1173 d. 6744

7. a. 622 b. 10593 c. 5826 d. 37539

8. a. 2788 b. 255,374 c. 1311 d. 12,390

9. a. 979 b. 37 c. 207 d. 13

10. a. 3. 8 b. 1. $10

11. a. 306 miles b. 13 months

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